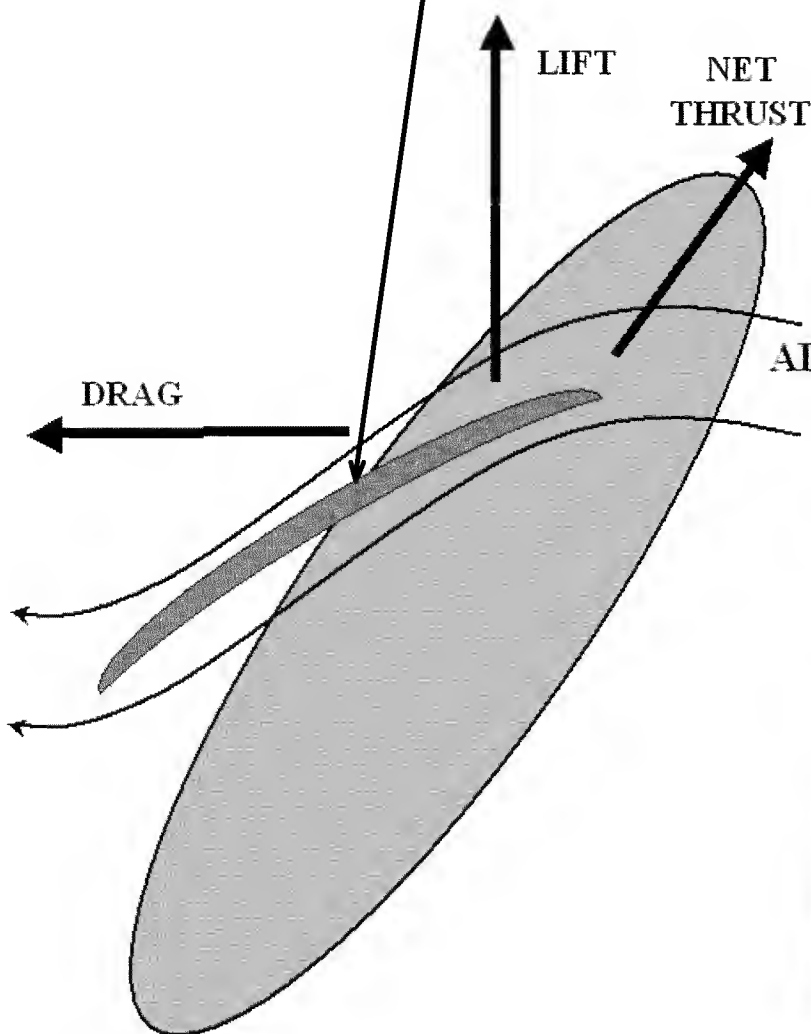
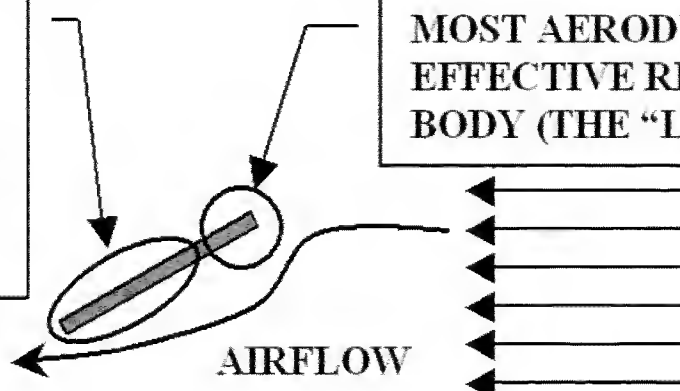
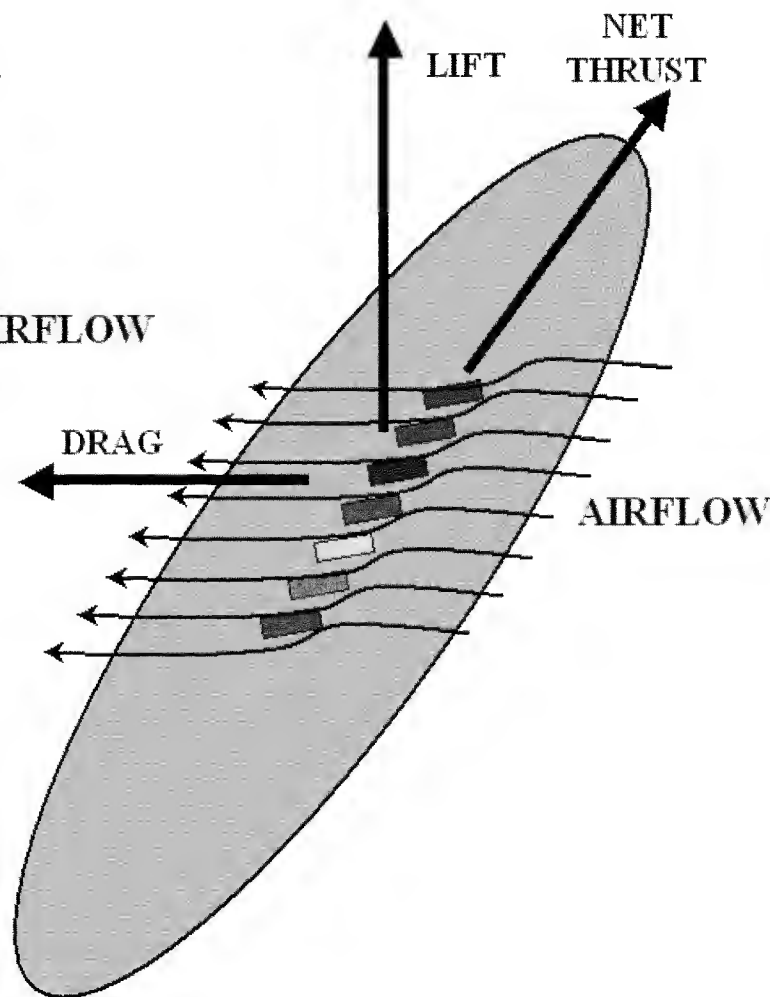


LEAST
AERODYNAMICALLY-
EFFECTIVE REGION
OF A BODY (THE BULK
OF A TYPICAL, FABRIC
SAIL)

MOST AERODYNAMICALLY-
EFFECTIVE REGION OF A
BODY (THE "LEADING EDGE")

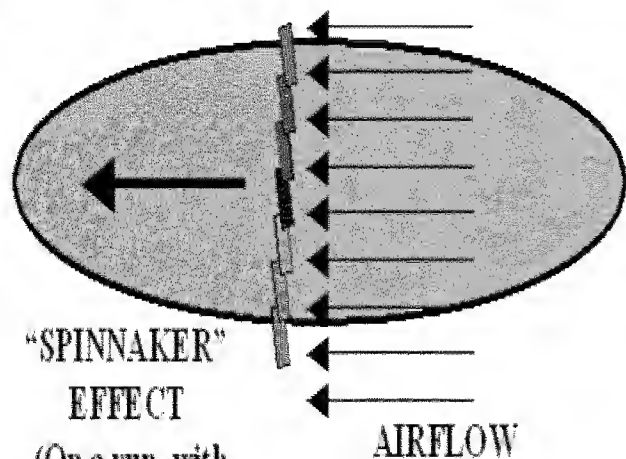


TRADITIONAL SAIL
(EFFECT & NOMENCLATURE)



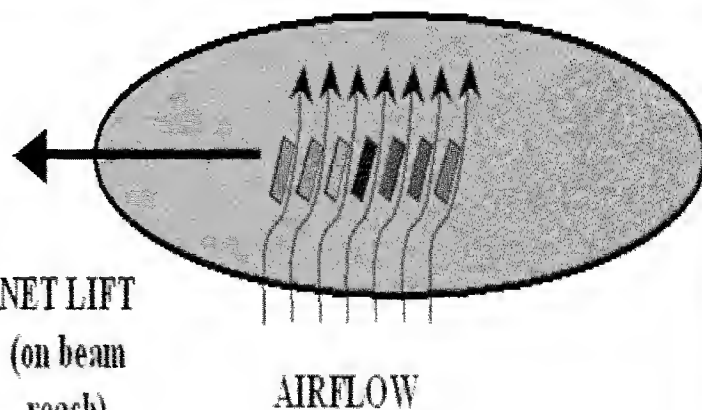
"BLADE SAIL"
(SIMILAR EFFECT & NOMENCLATURE)

FIGURE 1: DEPICTION OF A RELATED CONCEPT OF MAXIMUM LIFT AND MINIMUM DRAG PER WETTED AREA FOR THE LEADING EDGE REGIONS OF TYPICAL BODIES IN SUBSONIC AIRFLOW (SUCH AS A HIGHER LIFT-TO-DRAG RATIO FOR THE MULTIPLE LEADING EDGES OF A BLADE SAIL vs. THE SAME SAIL AREA IN A TRADITIONAL SAIL, FOR ANY GIVEN APPARANT WIND SPEED AND DIRECTION)

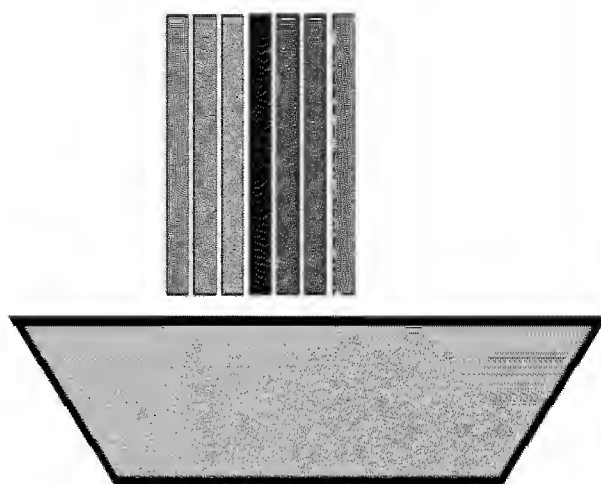
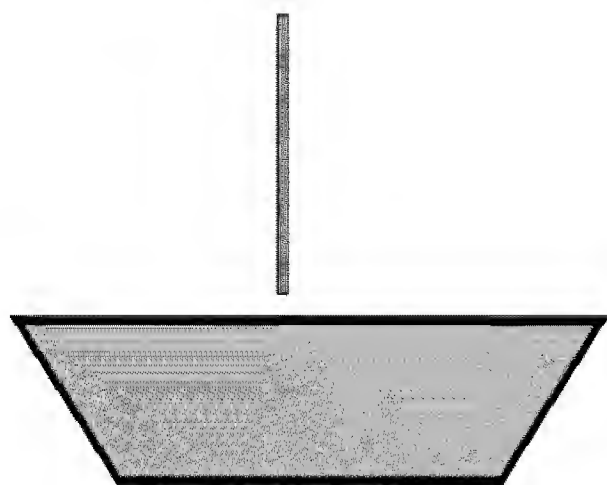


"SPINNAKER"
EFFECT
(On a run, with
boom rotated
and all blades
closed)

NET LIFT
(on beam
reach)



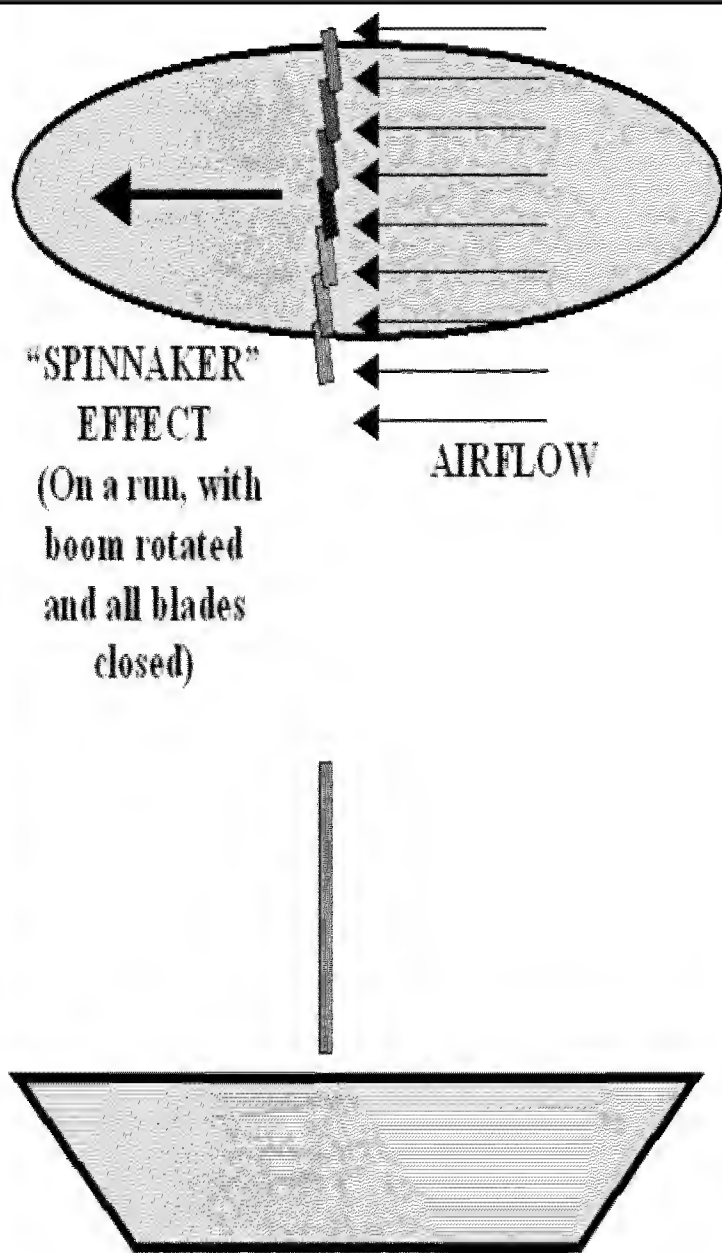
AIRFLOW



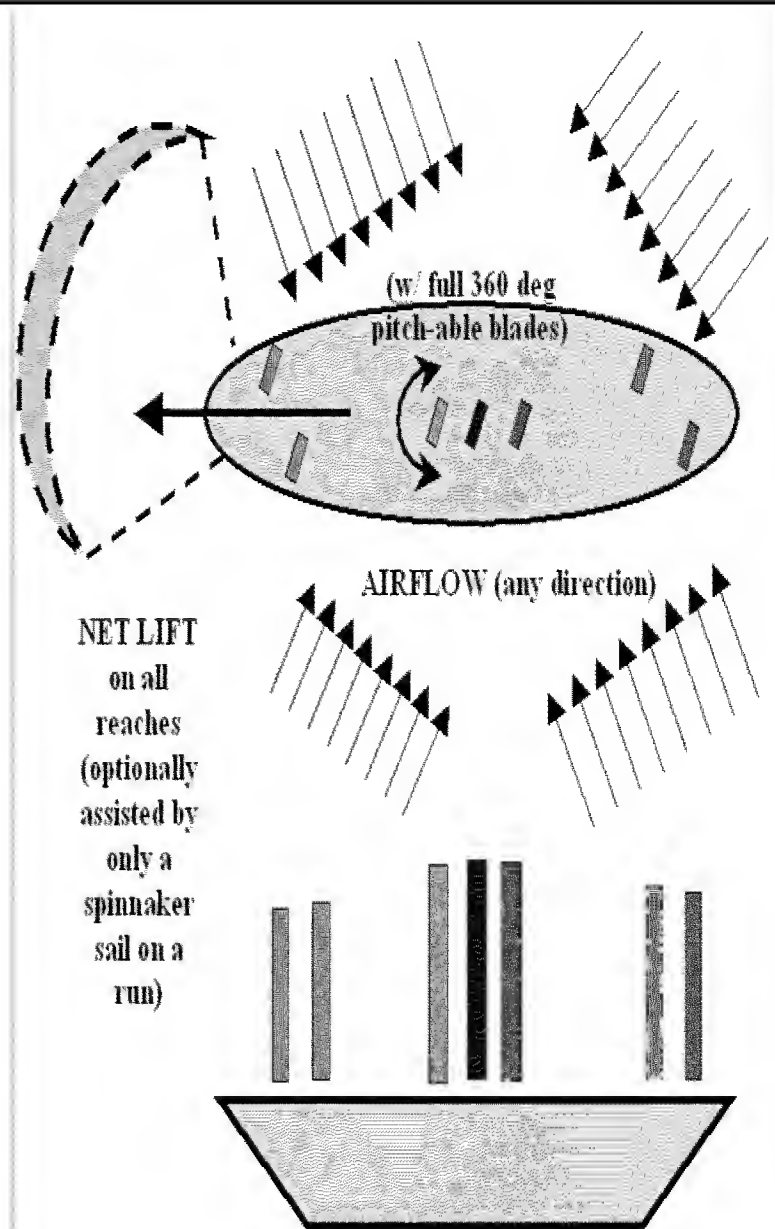
BLADE SAIL (BOOMED) SHOWN IN
"RUN" POSITION

BLADE SAIL (BOOMED) SHOWN IN
BEAM REACH POSITION

FIGURE 2: EXAMPLE OF MORE-EFFICIENT "BLADE SAIL"
CONFIGURATION (WHERE A GREATER LIFT AND LIFT-TO-DRAG RATIO IS
CREATED PER THE SAME SAIL AREA AS A TRADITIONAL SAIL - WHILE
SHORTENING THE EFFECTIVE MAST HEIGHT AND ALLOWING SAFER AND
MORE-EFFECTIVE TACKING, SAIL TRIM, AND THRUST CONTROL)



SAIL CONFIGURATION ON A BOOM
(SHOWN ROTATED FOR A RUN)



SAIL CONFIGURATION AS DEPLOYED
AROUND DECK (WITHOUT A BOOM)

FIGURE 3: EXAMPLE OF BOOMED vs. BOOMLESS BLADE SAIL ARRANGEMENT
(WHERE, IN EITHER CASE: A GREATER LIFT AND LIFT-TO-DRAG RATIO
IS CREATED PER THE SAME SAIL AREA AS A TRADITIONAL SAIL - WHILE
SHORTENING THE EFFECTIVE MAST HEIGHT AND ALLOWING SAFER
AND MORE-EFFECTIVE TACKING, SAIL TRIM, AND THRUST CONTROL)

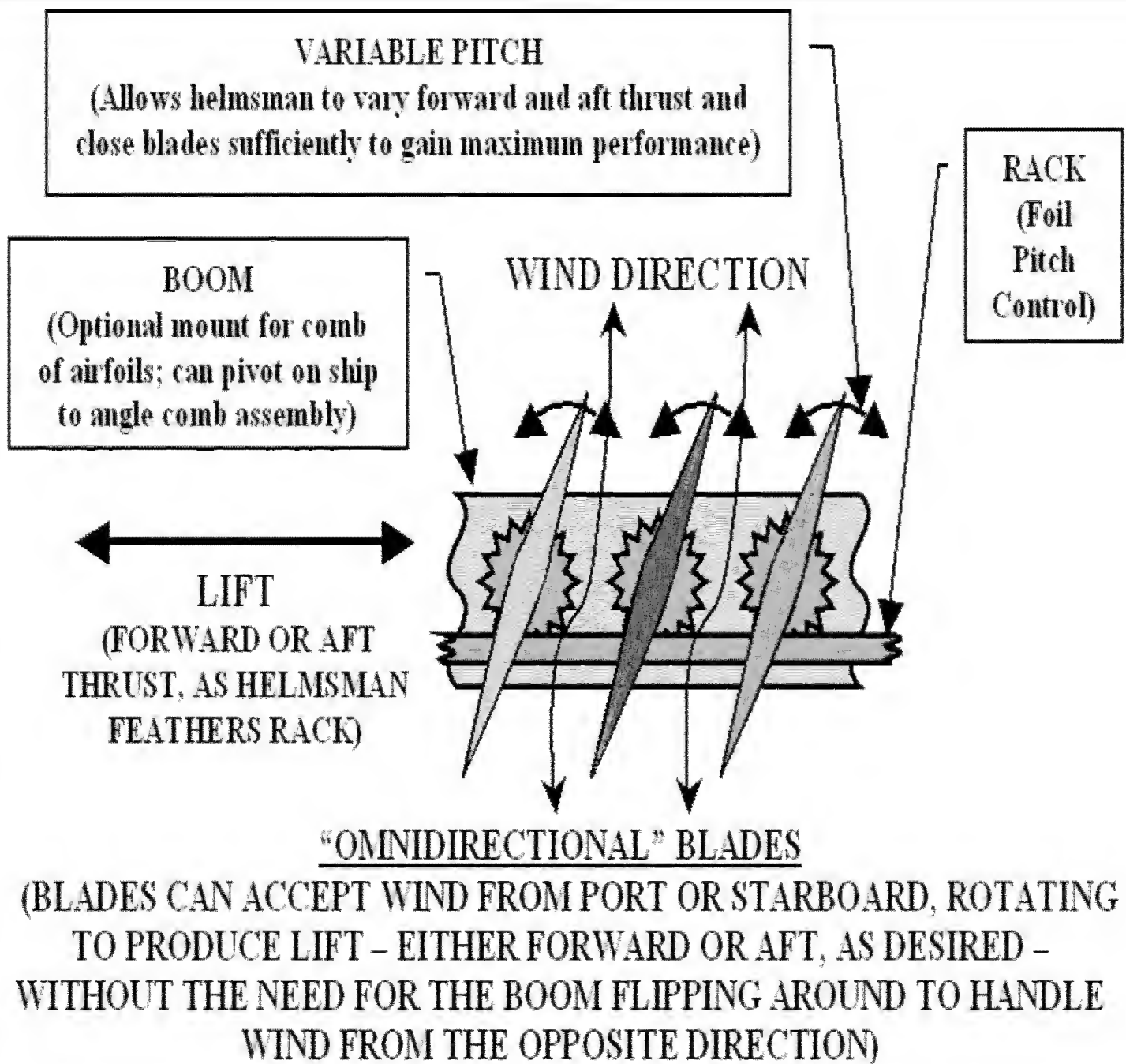


FIGURE 4: CONFIGURATION OF PREFERRED BLADE SAIL MECHANISM

(BLADES CAN BE ARRANGED CLOSE TOGETHER ON A BOOM - AS SHOWN - OR DISTRIBUTED AROUND THE DECK OF THE SHIP AND PITCH-CONTROLLED BY A CONNECTION ACROSS A NEAR-DECK-LEVEL PULLEY SYSTEM - SIMILAR TO THE CURRENT HARDWARE OF TRADITIONAL LINES & WINCHES ON A SAILBOAT)

DIRECTIONAL AIRFOILS - MAY INCREASE FORWARD THRUST,
BUT MAY REQUIRE "FLIPPING" TO PROVIDE OPTIMUM THRUST
IN OPPOSITE DIRECTION (ON A TACK).

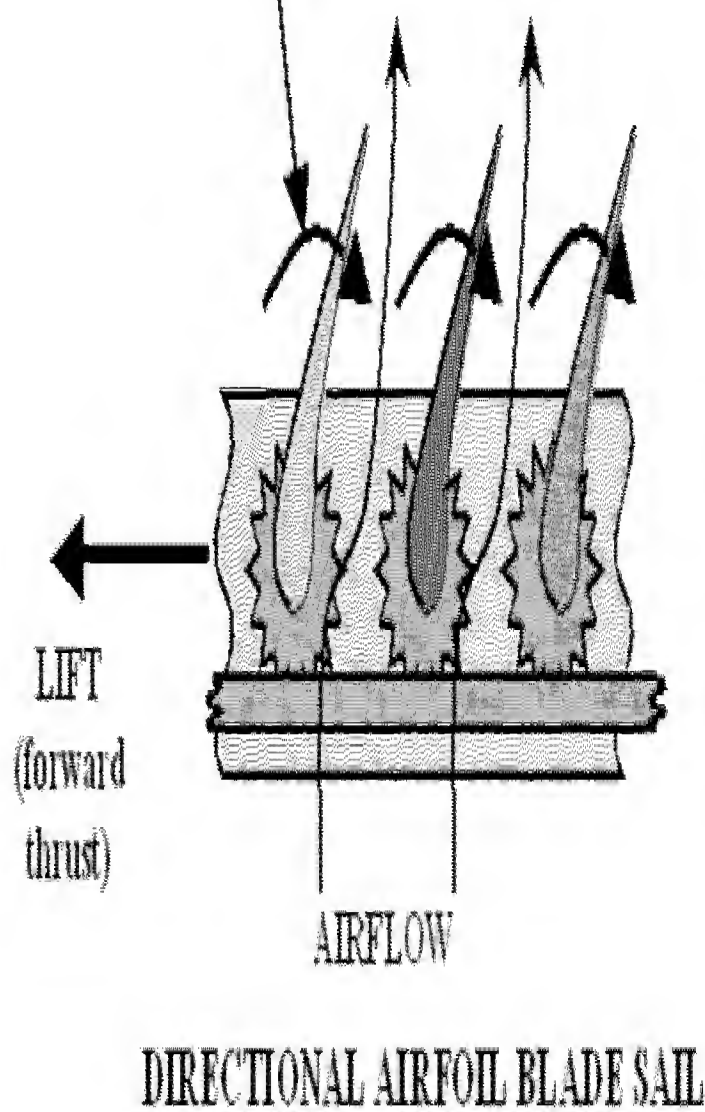
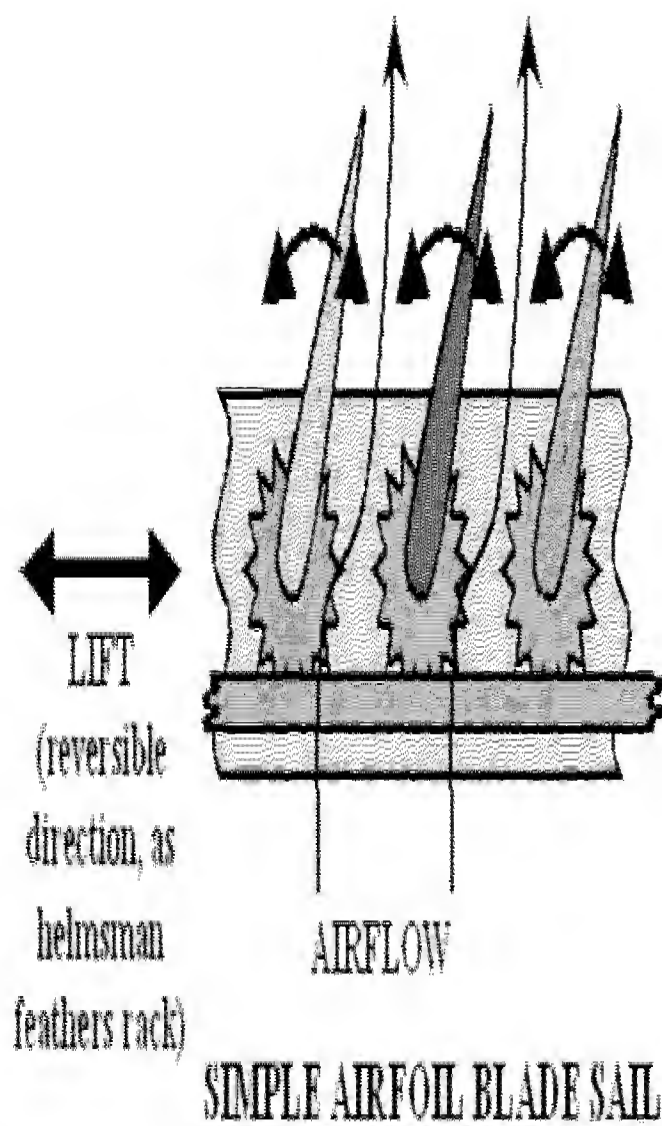
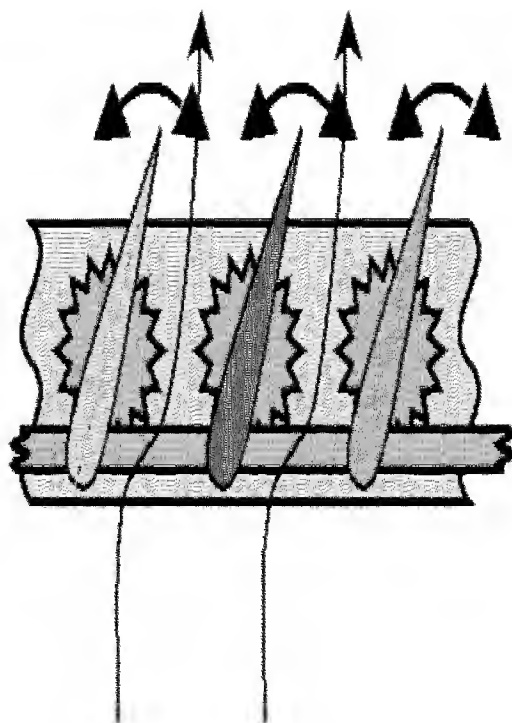
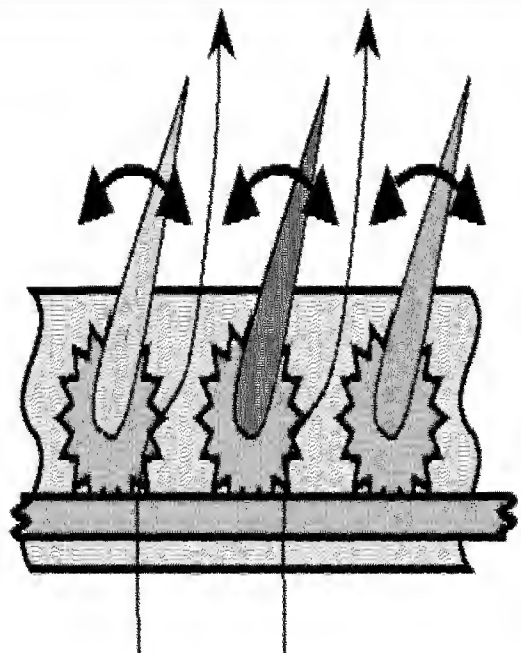


FIGURE 5: EXAMPLE OF VARIATIONS IN BLADE SHAPES (TEARDROP AND AIRFOIL, SHOWN)



“WEATHERVANING” BLADE POSITIONING
(BLADES LEEWARD OF AXLE, SO THEY
RELEASE TO ZERO LIFT WHEN RACK IS
RELEASED)

“NO-LOAD RACK” BLADE POSITIONING
(BLADES’ CENTERS-OF-PRESSURE ARE
POSITIONED ON AXLE, SO THERE IS NO BIAS
TO RELEASE LIFT OF BLADES, AND NO
CONSTANT LOAD ON RACK; MORE
PERFORMANCE-ORIENTED – BUT LESS SAFE
IN MAN-OVERBOARD CONDITION)

FIGURE 6: EXAMPLES OF VARIATIONS IN BLADE POSITIONS
(WEATHERVANING AND NO-LOAD RACK, SHOWN. NOTE:
CENTROID-CENTERED BLADES MAY HAVE A TENDENCY TO DRIVE
TOWARD INCREASING THE ANGLE OF ATTACK, RATHER THAN
RELEASING LIFT, AS THE CENTER OF PRESSURE OF ALL BODIES TENDS
TO BE NEARER THE LEADING EDGE.)